



Correlated Factors with Nutritional Behaviors in Elementary School Students; A Case Study in West of Guilan Province

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ABSTRACT

Aims Pre-adolescence is an essential time for the formation and stability of behaviors. The aim of this study was to determine the correlated factors with nutritional behaviors in elementary school students.

Materials & Methods In descriptive-analytic study, 300 fifth-grade elementary schools students of Talesh and Fouman cities of Guilan Province, Iran were selected using the random cluster method, in 2017. Data were collected by researcher-made questionnaire. The one way analysis of variance, two independent samples t-test, Spearman correlation coefficient, and SPSS 21 software were used.

Findings There was no significant relationship between demographic characteristics and nutritional behaviors ($p > 0.05$) but father's education level had a significant reverse correlation with barriers ($r = -0.147$; $p < 0.05$). The most important barriers of having breakfast during the week in school were lack of appetite and adequate time, and on vacation, was to be alone. Barriers were disliked milk, embarrassment of taking bread and cheese as a snack, and the lack of fruits and vegetables at home ($p < 0.05$). The important cues to action were mothers (76.5%), fathers (44.5%) and then health workers and teachers, respectively.

Conclusion Barriers play an important role in nutritional behaviors. The most important barriers of having breakfast during the week in school are lack of appetite and adequate time, and on vacation, being alone.

Keywords Nutrition; Behavior; Schools; Students

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[1] Dental ... [2] Parental influence on eating behavior: Conception to ... [3] Dietary quality among men and women in 187 countries ... [4] Application of the health belief model for unhealthy eating prevention among primary ... [5] Schools health and health ... [6] Are people who regularly eat breakfast cereals slimmer ... [7] Breakfast habits, nutritional status, body weight, and academic performance in ... [8] Qualitative and quantitative dietary assessment of primary school ... [9] Junk food consumption and child nutrition, nutritional ... [10] Krause's food, nutrition & di ... [11] Theoretical foundations of health ... [12] Breakfast and snack patterns of primary ... [13] Obesity, eating habits and nutritional knowledge ... [14] Physical activity, dietary practices, and other health behaviors of at-risk youth ... [15] Survey of the effect of education based on the Health ... [16] A study in the effect of education through health belief model on the ... [17] The effect of peer education based on health belief ... [18] The study of knowledge, attitude and nutritional ... [19] Breakfast consumption in UK schoolchildren ... [20] Survey of breakfast consumption status and ... [21] A systematic review of the quality, content, and context ... [22] Dietary habits among children aged 8-9 years ... [23] Health promotion in nursing ... [24] Survey of health and nutritional ... [25] Knowledge and perceived threat of students in relationship with their behavior in context of consumption of breakfast and snack in primary boy schools ... [26] Study of quality of snacking in adolescents ... [27] Surveying the food intake of primary school ... [28] Survey the eating pattern between elementary ... [29] Eating habits, sedentary behaviours and overweight and obesity among ... [30] A randomized school trial of environmental strategies to encourage fruit and vegetable consumption among ... [31] Study of nutrition patterns presented in advertising programs in networking 1 & 3 in the Islamic Republic of ... [32] The nutrients and their ... [33] Demographic, familial and trait predictors of fruit and vegetable consumption by pre-school ... [34] Impact of commercial eating on nutrient ... [35] Reference curves of anthropometric indices in two national studies conducted among ...

Introduction

The most part of body growth occurs during childhood, a poor diet can cause many diseases during childhood [1] and many nutritional patterns are formed at this stage of life [2]. The results of a global study on the nutritional quality of people around the world showed that unhealthy diet has gotten worse. In this study, comparing the elderly with younger people showed the healthiest diet in older adults. Higher-income and middle-income countries, in comparison with low-income countries, consume healthier foods, while they were worse in terms of eating unhealthy foods [3].

Inappropriate nutritional behavior is also increasing in Iranian students similar to many developing countries [4]. Students are vulnerable and they need more attention, because they have easy access to low nutritional value products, lack of mobility, and they are in their developmental processes [5]. Eating breakfast preserves proper weight and improves memory [6, 7]. On the other hand, one of the nutritional problems associated with childhood and adolescence is eating too much inappropriate snacks. The main feature of this group of food is their low nutritional value and high-calorie content mixing with too many salt or sugar [8]. The consequences of eating too much low nutritional value food in children and adolescents include obesity, dental caries, and chronic diseases [9].

The nutritional habits and patterns in children are initially only affected by the family environment, but they change when they go to the school; although children spend more time away from home and parent control [10]. It is inevitable to pay special attention to healthy food and school buffet supervision. Schools are the best places to provide health plans and reduce health problems [5].

Several factors affect the nutritional behaviors of students. One of the important factors is barriers to healthy eating behavior which prevent proper health behaviors [11]. In some studies, the most important reasons for the lack of breakfast as the first meal of the day were reported as having no appetite, the families and students rush to go to school [12], repetitive kind of breakfast, and fears and worries about going to school [13]. The lack of access to fruits and vegetables was also reported as a specific barrier to the regular consumption of fruits and vegetables [14].

Other factors related to nutritional behaviors are cues to action; these are the symptoms that people receive from their surroundings about how to act or behave [11]. Cues to action can guide students to obtain proper nutrition information and use healthy foods, which have been examined in some studies [15, 16]. Given the fact that today's children are the parents of tomorrow, and since proper nutrition is important in the health status of students, the effective role of schools in providing proper

nutrition education and prevention of inappropriate food behaviors is very prominent. The results of this study can help to design educational interventions.

The aims of the present study were to determine the status of nutritional behaviors and to find its correlated factors among 5th-grade elementary school students.

Instrument and Methods

This descriptive-analytic study was done in Guilan, Iran in 2017. The study was performed on 300 male and female students of 5th-grade elementary school from 25 public urban schools in different parts of Talesh and Fouman cities (One class from each school) in 2017 using the random cluster method. The inclusion criteria included obtaining written consent from parents and students and not having a specific diet; and the exclusion criteria included not completing the questionnaire.

The data were collected using a researcher-made questionnaire, in self-administered and anonymous form. The validity and reliability of the questionnaire were approved. Lotfi *et al.* Questionnaire [17] was used as a preliminary tool and was revised by the research team. The face validity of the questionnaire was assessed by 10 fifth-grade students outside the final sample (5 girls and 5 boys). The editorial errors were corrected. Content validity of the questionnaire was also confirmed by a panel of experts, including 7 health education specialists, 2 nutBiostatistics and a biostatistics. The reliability of nutritional behavior questions was determined using a test-retest method; the questionnaire was completed by 30 students (15 girls and 15 boys) in two stages with a two-week interval and the intra-class correlation was calculated 0.67. The reliability was calculated based on Cronbach's alpha coefficient in order to measure the internal consistency of barrier factors for nutritional behavior, which was 0.77. The reliability of the cues to action was calculated from the test-retest and the Kappa agreement coefficient was calculated 0.8- 1 for all items.

The questionnaire was consisted of 4 parts as follow:

First, the demographic characteristics of the students using 7 questions including gender, number of children in the family, birth rate, father and mother's occupation, father and mother's education.

The next part included the barriers to eating breakfast, snack and healthy foods, using 12 questions, with a 5 points Likert-scale ranged from "strongly disagree" (1 point) to "strongly agree" (5 points) and the total scores of 12-60.

The third part included the nutritional cues to action using 1 question, with choosing mother, father, physician or health provider, teacher, book, television, magazine, brother or sisters, friends, and

other factors by the students.

The final part of the questionnaire included nutritional behaviors such as eating breakfast within the school days (with rarely or not at all, one to two days, three to four days, and all school days answers with a score of 0-3), eating breakfast on weekends (with rarely or not at all, usually and always answers with a score of 0-3), eating snacks (with not at all, once a day, twice a day, more than twice a day answers with a score of 0-3); eating healthy foods included fruits and vegetables, bread and cheese and walnuts, salt-free nuts, milk and dairy products; eating unhealthy foods included sweets and chocolates, chips and puffs, soft drinks and sausages.

Zero score was considered for the poor nutritional behavior, and the score of 3 for the desirable nutritional behavior.

For the frequency of food intake in both groups, the answers of rarely or not at all, twice or more a week, once a day, and two or more a day were used with a score of 0-12; both high levels of healthy and unhealthy eating behaviors indicated a more favorable nutritional behavior.

Before completing the questionnaires, the necessary explanations were given to all the participants about the main objectives of the study and how to answer the questions. The questionnaire was completed by students within approximately 50 minutes.

For descriptive data analysis based on the type of variable (qualitative and quantitative), the percentage and Mean (SD) indices were used. The one-way analysis of variance (or the nonparametric equivalent of Kruskal-Wallis), two independent samples t-test (or the nonparametric equivalent of Mann-Whitney) and Spearman correlation coefficient were used respectively to determine the correlation between barriers, eating breakfast, snack, healthy and unhealthy foods with qualitative and quantitative demographic characteristics. Also, the Spearman correlation coefficient was used to evaluate the correlation of barriers to eating breakfast, snack, healthy and unhealthy foods. Data were analyzed using SPSS 21 software.

Findings

From the total number of 300 participants, 50.0% were female and 50.0% were male. The highest percentage of father's occupation was related to 42.0% self-employed and for mothers' occupation 87.7% housewives; in terms of education level, 34.7% of fathers and 38.0% of mothers had high school level (Table 1).

The mean score of the barriers was 25.34±7.68. Examining the relationship between barriers and demographic variables showed that father's education level had a significant reverse correlation with barriers ($r=-0.147$; $p<0.05$). Other demographic variables had no significant correlation with barriers ($p>0.05$).

Examining the relationship between each barrier and demographic variables showed that there was a significant statistical correlation between the barriers of "not having enough time to eat breakfast" and "difficulty to bring healthy snacks from home" with gender ($r=-0.148$ and $r=0.185$; $p<0.05$); so that, the "not having enough time to eat breakfast" and "difficulty to bring healthy snacks from home" barrier were respectively higher in girls and boys.

There was also a direct and significant correlation between the number of children in family and the barriers of "not eating fruit due to lack of fruit at home" and "difficulty to bring healthy snacks from home" ($r=0.119$ and 0.185 ; respectively; $p<0.05$).

There was a significant relation between father's occupation and the barrier of "not eating fruit due to lack of fruit at home"; so that, it was higher in students whose father was self-employed ($\chi^2=6.875$; $p<0.05$). Other demographic variables had no significant correlation with barriers ($p>0.05$).

The most important barriers to eating breakfast during school days were lack of appetite and lack of enough time ($r=-0.240$; $r=-0.225$; respectively; $p<0.001$). The most important barrier for eating breakfast during weekends was "being alone while eating breakfast" ($r=0.152$; $p<0.05$). The most important barriers to eating healthy foods were "disliking milk", "embarrassment for eating bread and cheese" and "lack of fruits and vegetables at home" ($r=-0.191$; $r=-0.178$; $r=-0.163$; respectively $p<0.05$).

The most important cues for action for students included mother 76.5%, father 44.5%, physician or health provider 36.5%, teacher 30.5%, and books 25.5%.

65.4% of participants were eating breakfast within all school days, while 7.3% going to school without breakfast. Eating breakfast was 74.0% on weekends and 4.0% did not eat breakfast even on weekends (Table 2).

45.3% and 90.8% of the students were in the desirable condition regarding healthy and unhealthy foods, respectively (Table 3, 4, and 5).

Demographic variables were not significantly related to nutritional behaviors ($p>0.05$). Regarding the categories of nutritional behaviors, there was no significant relationship between demographic characteristics and healthy and unhealthy foods among students ($p>0.05$).

There was a significant relation between father's occupation and eating breakfast on school days ($\chi^2=7.674$; $p<0.001$). So that, it was higher in students whose father was employed. Also, maternal occupation had a significant relation to snack consumption ($\chi^2=7.381$; $p<0.05$); so that students with housewife mothers consumed fewer snacks. Gender had a significant relation to snack consumption ($\chi^2=9.247$; $p<0.05$); so that, girls consumed more snacks (with median of one versus

two times a day for girls and boys; respectively). Other demographic variables were not significantly correlated with eating breakfast and snacks ($p>0.05$).

Table 1) Frequency distribution of demographic characteristics of the students (The numbers in parentheses represent percent, $n=300$)

Demographic characteristics	Frequency
Gender	
Female	150 (50.0)
Male	150 (50.0)
Fathers' Occupation	
Employee	60 (20.0)
Worker	114 (38.0)
Self-Employee	126 (42.0)
Mothers' Occupation	
Housewives	263 (87.7)
Employee	16 (5.3)
Self-Employee	21 (7.0)
Fathers' educational level	
Illiterate and Primary school graduate	63 (21.0)
Secondary school graduate	95 (31.6)
High school graduate	104 (34.7)
Collage or higher graduate	38 (12.7)
Mothers' educational level	
Illiterate and Primary school graduate	78 (26.0)
Secondary school graduate	79 (26.3)
High school graduate	114 (38.0)
Collage or higher graduate	29 (9.7)

Table 2) Frequency distribution of eating breakfast (within the school days and on weekends) and snacks (The numbers in parentheses represent percent, $n=300$)

Behavior	Frequency
Eating breakfast within the school days	
rarely or not at all	22 (7.3)
one to two days	36 (12.0)
Three to four days	46 (15.3)
All school days	196 (65.4)
Eating Breakfast on weekends	
Not at all	12 (4.0)
Rarely	18 (6.0)
Usually	48 (16.0)
Always	222 (74.0)
Eating Snacks	
Not at all	38 (12.7)
Once a day	95 (31.7)
Twice a day	104 (34.6)
More than twice a day	63 (21.0)

Table 3) Characteristics of nutritional behaviors among the students

Nutritional behaviors	Healthy food	Unhealthy food
Number of questions	4	4
The range of obtainable values	0-12	0-12
The range of obtaining values	4-12	3-12
Mean±SD	10.16±1.46	7.76±1.78

Table 4) Classification of nutritional behaviors in healthy and unhealthy food among the students (The numbers in parentheses represent percent, $n=300$)

Classification of Scores	Healthy food	Unhealthy food
Undesirable (≤ 6)	15 (5.0%)	6 (2.0%)
Moderate (7-12)	149 (49.7%)	22 (7.3%)
Desirable (≥ 13)	136 (45.3%)	272 (90.7%)

Table 5) Frequency distribution of eating healthy and unhealthy food among the students (The numbers in parentheses represent percent, $n=300$)

Behavior	Rarely or not at all	Twice or more a week	Once a day	Twice or more a day
Eating healthy food				
Fruits and vegetables	12 (4.0)	126 (42.0)	87 (29.0)	75 (25.0)
Milk and dairy products	18 (6.0)	6 (2.0)	153 (51.0)	123 (41.0)
Bread and cheese and walnuts	33 (11.0)	102 (34.0)	81 (27.0)	84 (28.0)
Salt-free nuts	27 (9.0)	153 (51.0)	57 (19.0)	63 (21.0)
Eating unhealthy food				
Sweets and chocolates	159 (53.0)	114 (38.0)	21 (7.0)	6 (2.0)
Chips and puffs	141 (47.0)	147 (49.0)	9 (3.0)	3 (1.0)
Soft drinks	189 (63.0)	99 (33.0)	9 (3.0)	3 (1.0)
Sausages	243 (81.0)	39 (13.0)	12 (4.0)	6 (2.0)

Discussion

The present study aimed to determine the correlated factors with nutritional behaviors in 5th-grade elementary school students in the western part of Guilan province.

In the total participants, 65.4% of the students had breakfast at school all day, which was lower than some similar studies (71.8% to 86.0%) [18, 19], and higher than some other studies [20, 21], in which 25.0% to 35.0% of students had breakfast all school days. The results also showed that 7.3% of students went to school without eating breakfast. This amount was reported as 8.6% to 20.5% in some similar studies [12, 22].

In this study, eating breakfast observed far from the desired level and barriers play an important role in this regard. Barriers are the most important factors to prevent healthy behaviors, but it is not easy to control them. According to the results of this study, the father's educational level had a significant reverse correlation with barriers, which may indicate that raising their educational level can decrease the understanding of barriers to healthy nutritional behaviors, by increasing knowledge and sensitivity. Obstacles include factors such as lack of access, high cost, disparity, difficult, or time

consuming [23]. In the present study, barriers of eating breakfast during school days included lack of appetite or lack of time. Some similar studies [12, 24] reported factors such as waking up late, lack of time, and lack of appetite early in the morning. Changing structures and patterns of family behavior in recent years, such as eating dinner late or sleeping late, have been relatively common among Iranians, and can be factors affecting the waking up late and the lack of appetite for breakfast in the morning. The lack of time was particularly more common among girls, because they are more likely to spend more time preparing for school. Such issues must be developed and educated to parents and students in order to reduce related barriers. Parents should learn not to delay dinner time until the end of the night. In addition, to sleep early in the night and wake up earlier in the morning, parents should have proper and regular schedule for their children. Particularly, higher rate of eating breakfast behavior in students with employee fathers can be the evidence of this claim. Regarding the important role of breakfast meal in preservation of proper weight and improvement of memory and concentration [6, 7], it is important to encourage students to eat breakfast every day.

According to the findings of the present study, 55.6% of the students consumed snacks twice or more a day, 31.7% once a day, and 12.7% had no snacks. In studies of Luria *et al.* and Lotfi *et al.*, 43.0% and 35.2% of students did not consume snacks, respectively [22, 25]. It should be mentioned that the study population were residents in Guilan province, and the center of this province namely Rasht, has been registered as a food creative city at UNESCO. In the culture of Guilan province, attention to nutrition and food diversification was higher than Lotfi *et al.* (Zahedan) study [25], so it is natural to consume more snacks. The result of the study conducted by Moaadel *et al.* in Darab, Fars province [18], 13.8% of participants did not consume the snack, which is similar to the present study, and it indicates the cultural similarity in this regard. But the result of a study in one of Tehran's regions showed that the majority of families in the capital of Iran is more interested in eating snacks than in our study population; based on the results of that study only 5.5% of the students did not consume snacks [26], but another study on all regions of Tehran showed that 17.7% did not consume snacks [27]. It is important to consume proper and healthy snacks during school hours, because most of students, get hungry and cannot have the necessary focus on learning the lessons.

In this study, students with housewife mothers consumed fewer snacks, which showed that working mothers pay more attention in this regard. In addition, girls consumed more snacks than boys, which is mainly due to it is hard to bring snacks from home among boys compared to girls, while on

the other hand, this was an important barrier in families with more children, too. It seems to have more children can reduce the attention of families in this regard. The above mentioned findings require more attention in the planning and educational interventions.

In the present study, 45.3 percent of all students were in desirable condition in terms of healthy food intake. In the study of Soheili in 2007 in Langrood, Guilan, appropriate food consumption was reported 98.2% [28]. Comparing these two results may be indicated a decrease in the consumption of healthy food during this period of time. Another study conducted in Darab, Fars province indicated that only 35.0% of students consumed healthy food [18]. Some studies from other countries also reported a very low consumption of foods containing micronutrients such as vegetables, fruits and milk among a large number of children and adolescents [29, 30].

In terms of the consumption of healthy foods in students, 46.0% did not eat fruits and vegetables daily, 8.0% did not eat milk and dairy products daily, 45.0% did not eat bread and cheese and walnuts daily, and 60.0% did not eat salt-free nuts daily. These issues should be necessarily considered in educational programs. The results of Lotfi *et al.* (Zahedan) study on the percentage of daily intake of at least one meal of fruits and vegetables, milk, bread and cheese were similar to the present study [25].

In the present study, the most important barriers to consume healthy foods were reported disliking milk, embarrassment for eating bread and cheese and the lack of fruits and vegetables at home, among which the last barrier was more observed in families with more children and students with self-employee fathers that could be affected by the cultural or economic characteristics of these families. According to studies, a significant proportion of the TV advertising is devoted to unhealthy foods [31], which could increase the tendency of children to eat unhealthy snacks.

Parents and student education seems to be very important to preserve proper food intake patterns. So, it is necessary to teach about the benefits of eating milk and dairy as a rich source of calcium, because studies have shown that there is a relationship between sufficient calcium intake with decreased risk of several chronic diseases for example osteomalacia, osteoporosis, hypertension, and obesity [32]. Fruit and vegetable intake reduces the likelihood of problems such as obesity, diabetes, cancers and cardiovascular diseases [33]. Given the obvious benefits of fiber consumption, educational interventions are needed to learn consuming more fiber containing foods in the population. Parents need to be taught about planning how to allocate more expenses on the fruits and vegetables and avoid spending excessive costs of inappropriate

food. In addition, in the case of a barrier of embarrassment for eating bread and cheese, nutritional education programs should emphasize that bread and cheese are very healthy meals, unlike fast foods that contain preservative and unhealthy foods. In this regard, culture must be developed to train beliefs towards consuming healthy and nutritious foods.

In the present study, 90.7% of students were in desirable condition in terms of unhealthy food consumption and 2.0% were in undesirable condition. In similar studies, the use of unauthorized foods was reported 1.8% in Langrood and 14.2% in Tehran [27, 28], and it shows that there is a direct relationship between the more industrialized societies and the increased consumption of unauthorized foods. Another study found that 43.9% of the students had three or more improper food habits [22]. Inappropriate food habits are one of the most important factors in the nutritional deficiencies, especially calcium and vitamins B₆, A, C, both hidden or obvious malnutrition, and behavioral changes in students [34]. As a result, understanding nutritional needs and nutritional recommendations in this period seems necessary. According to previous studies, the consumption of unhealthy foods has led to a significant reduction in the consumption of healthy foods [35]. Although in this study, the consumption level of unhealthy foods was low, the importance of this period can justify the necessity to achieve a desirable situation for all students.

In the present study, the most important cues to action mentioned by the students included mothers, father, physician or health provider and teacher, respectively. In the study of Shojaezadehe *et al.* [15] the most important cues to action were first family and second and third as teachers and friends; in the study of Khazaie Pool *et al.*, [16] these factors included family and television. So based on the previous studies, it is important to identify the cues to action, because they play a key role in influencing people's knowledge, beliefs and behaviors, and this issue should be considered in planning interventions and the important thing is that, devoting time in nutritional education programs is necessary to promoting the health of a large number of students, their families and community.

Nutritional behaviors, especially for breakfast, snack and healthy food, should be promoted with a focus on reducing the most important barriers in each of them. Parents, especially mothers, were the most important cues to action that should be considered in educational intervention programs. It should be considered that, devoting time in these programs is necessary to promoting young adolescents, their families and the community health.

The limitation of this study was to use a self-report tool; therefore, an anonymous questionnaire was used and participants were assured of

confidentiality of the information.

Some suggestions include planning and implementation of the educational intervention based on the findings of the study with regards to reducing barriers of the eating breakfast and consumption of milk, fruit, and vegetable in the population under study. Also, in the future, nutritional behaviors must be studied in non-governmental schools and among adolescents.

Conclusion

Barriers play an important role in nutritional behaviors. The most important barriers of having breakfast during the week in school are lack of appetite and adequate time, and on vacation, being alone.

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